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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,103	10/14/2003	Julian Norley	P1083/N9631	4471
23456	7590	12/06/2004	EXAMINER	
WADDEY & PATTERSON 414 UNION STREET, SUITE 2020 BANK OF AMERICA PLAZA NASHVILLE, TN 37219			CHAN, SING P	
			ART UNIT	PAPER NUMBER
			1734	

DATE MAILED: 12/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/685,103

Applicant(s)NORLEY ET AL. DN**Examiner**

Sing P Chan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 13-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 24-34 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☒ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) ☐ Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2/2/04-10/5/04</u> . | 6) ☐ Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-12 and 24-34, drawn to a method for applying heat spreaders to a plurality of plasma display panels, classified in class 156, subclass 249.
 - II. Claims 13-23, drawn to a heat spreader, classified in class 428, subclass 40.1.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the product as claimed can be used in a materially different process of using that product such as a heat conductive film between a heat sink and a transistor.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, the search required for Group I is not required for Group II, and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with James R. Cartiglia on November 19, 2004 a provisional election was made without traverse to prosecute the invention of group I, claims 1-12 and 24-34. Affirmation of this election must be made by applicant in replying to this Office action. Claims 13-23 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-11 and 24-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morita et al (U.S. 5,831,374) in view of Tzeng et al (U.S. 6,245,400).

Regarding claims 1, 10, 24, and 32, Morita et al discloses a method of forming plasma display or a plurality of plasma displays. The method includes fixing a high-orientated graphite film, i.e. heat spreader onto the curved surface of the back of the panel unit by gluing. (Col 9, lines 9-28) Morita et al is silent as to the heat spreader as a composite with a layer of adhesive and release material. However, providing a heat

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spreader as a composite with a layer of adhesive and release material is well known and conventional as shown for example by Tzeng et al. Tzeng et al discloses a flexible graphite sheet article with low thermal resistance, i.e. a heat spreader, an interface sheet to thermally connect a computer chip to a cooling module. (Col 1, lines 44-47) The heat spreader includes a flexible graphite sheet, pressure sensitive adhesive layer, and a release liner, which is easily removed during use of the heat spreader. (Col 6, lines 19-29)

It would have been obvious to one of ordinary skill in the art the at the time the invention was made to provide a flexible graphite sheet with pressure sensitive adhesive layer, and a release liner as a heat spreader as disclosed by Tzeng et al in the method of Morita et al to provide a release lined pressure sensitive adhesive flexible graphite sheet with low thermal resistance with the release liner being easily removed without delamination of the flexible graphite sheet. (Col 2, lines 3-9)

Regarding claims 2 and 25, Morita et al is silent as to release material and adhesive are selected to permit a predetermined rate of release without causing damage to the heat spreader material. However, selecting a release material and adhesive to permit a predetermined rate of release without causing damage to the heat spreader material is well known and conventional as shown for example by Tzeng et al. Tzeng et al is considered to disclose selecting pressure sensitive adhesive and release liner to allow the release liner to be removed at a predetermined rate of release without causing damage to the heat spreader material. (Col 5, line 53 to Col 6, line 8)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide release material and adhesive with a predetermined rate of release without causing damage to the heat spreader material as disclosed by Tzeng et al in the method of Morita et al to provide a release lined pressure sensitive adhesive flexible graphite sheet with low thermal resistance with the release liner being easily removed without delamination of the flexible graphite sheet. (Col 2, lines 3-9)

Regarding claims 3-6 and 26-28, Morita et al as modified above is silent as to release material has a load of no greater than 40 grams per centimeter at a release speed of one meter per second or no greater than about 10 grams per centimeter at a release speed of one meter per second and a minimum lap shear adhesive strength of at least about 125 grams per square centimeter or an average lap shear adhesion strength of at least about 700 grams per square centimeter. However, one of ordinary skill in the art would appreciate optimizing the load and lap shear adhesive strength of the release material through routine experimentation and is not inventive to discover the optimum or workable ranges. See *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to experimentally determine the working ranges for load and lap shear adhesive strength in the method of Morita et al as modified by Tzeng et al to improve upon what is already known to provide a set of optimum ranges.

Regarding claims 7-9 and 29-31, Morita et al is silent as to the adhesive layer of less than 0.5 mils or less than 0.25 mils, which results in an increase in through

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thickness thermal resistance of the adhesive/heat spreader material not more than 35% as compared to the heat spreader material. However, providing adhesive layer with through thickness not more than 35% as compared to the heat spreader material is well known and conventional as shown for example by Tzeng et al. Tzeng et al discloses the thickness of the graphite sheet is between 0.1 mil to 500 mil and the adhesive layer has a thickness of 0.1 mil to 3 mil, which provided an increase thickness ranges from 300% to 0.02% as compared to the heat spreader material.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide any adhesive thickness as needed as compared to the heat spreader thickness such as not more than 35% as disclosed by Tzeng et al in the method of Morita et al to provide a release lined pressure sensitive adhesive flexible graphite sheet with low thermal resistance with the release liner being easily removed without delamination of the flexible graphite sheet. (Col 2, lines 3-9)

Regarding claims 11 and 33, Morita et al is silent as to the graphite sheet is formed of particles of exfoliated graphite. However, forming graphite sheet with particles of exfoliated graphite is well known and conventional as shown for example by Tzeng et al. Tzeng et al discloses forming the graphite sheet by using exfoliated graphite particles or worms. (Col 4, lines 40-45)

It would have been obvious to one of ordinary skill in the art the time the invention was made to use exfoliated graphite particle to form graphite sheet as disclosed by Tzeng et al in the method of Morita et al to provide a release lined pressure sensitive adhesive flexible graphite sheet with low thermal resistance with the

release liner being easily removed without delamination of the flexible graphite sheet.

(Col 2, lines 3-9)

8. Claims 12 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morita et al (U.S. 5,831,374) in view of Tzeng et al (U.S. 6,245,400) as applied to claims 11 and 33 above, and further in view of Brookes (U.S. 3,981,427).

Morita et al as modified by Tzeng et al is silent as to the heat spreader comprises a plurality of sheets of compressed particles of exfoliated graphite. However, forming heat spreader with a plurality of sheets of compressed particles of exfoliated graphite is well known and conventional as shown for example by Brookes. Brookes discloses a method of forming a graphite sheet laminate. The laminate includes a metal substrate and two graphite sheets bonded to the surface of the metal sheet or includes multiple layers of alternating sheets of coated substrate and graphite sheets. (Col 4, lines 45-54 and Col 6, lines 45-52)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to bond graphite sheets to a metal sheet to form a multi-layered laminate as disclosed by Brookes in the method of Morita et al as modified by Tzeng et al to provide a laminate construction with good conduction of heat where rapid transfer of heat is desired. (Col 4, lines 51-54)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sing P Chan whose telephone number is 571-272-1225. The examiner can normally be reached on Monday-Friday 7:30AM-11:00AM and 12:00PM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher A Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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